

MICROFICHE LABEL -- SPECIAL TITLE

ATTENTION DATA ENTRY

Please use the following title for the label on this fiche:

E I DUPONT DENEMOURS & CO
INC - 1,3-DIOXOLANE

Microfiche # 215001

Document ID #

OFFICE OF TOXIC SUBSTANCES
CODING FORM FOR GLOBAL INDEXING

REV. 7/27/82

Microfiche No. (7) •		215001		1 No. of Pages		2	
Doc I.D.		878220002		3 Old Doc I.D.		4 8DS	
Case No.(s)		OTS 84003A				5	
Date Produced (6)		6 052341		7 Date Rec'd (6)		8 030483	
				7 Conf. Code •		8 S	
Check One: <input type="checkbox"/> Publication <input type="checkbox"/> Internally Generated <input checked="" type="checkbox"/> Externally Generated							
ab/Journal Name _____							

Author(s) _____							

Organ. Name							
E I DUPONT DENEMOURS & CO INC							
Dept/Div _____							
P.O. Box _____ 13 Street No./Name _____							
City							
WILMINGTON 15 State DE 16 Zip 19898 17 Country _____							
MID No. (7) _____ 19 D & B NO. (11) _____							
Contractor _____							
Doc Type							
• R. I. • U. P. • H. E. A. S. • D 8. D. . S. U. H. S. F. N.							
Doc Title							
TOXICITY OF DIOXOLANE AND							
ITS DERIVATIVES WITH COVER LETTER							
& COVER SUMMARY							
Chemical Name (300 per name)							
1,3-DIOXOLANE							
CAS No. (1C)							
646-06-0							

check
7/1/82

1B



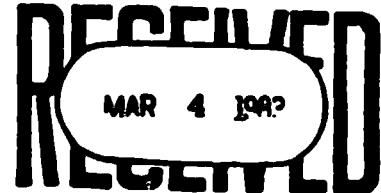
E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
WILMINGTON, DELAWARE 19898

ENVIRONMENTAL QUALITY COMMITTEE

March 4, 1983

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

U.S. Environmental Protection Agency
TSCA 8D1
P. O. Box 2060
Rockville, MD 20852



Gentlemen:

Health and Safety Data Reporting:
ITC Eleventh Report

On behalf of E. I. du Pont de Nemours and Company (Du Pont), I am pleased to submit the attached health and safety studies for the ITC Eleventh Report listed chemicals published at 47 Fed. Reg. 54626 (1982).

Please note that Du Pont is submitting both confidential and non-confidential copies of the reportable health and safety studies under 40 CFR 716.16.

Very truly yours,

Robert R. Bonczek
Director of Safety, Health
and Environmental Affairs

RRB:mdm
Attachments

1C

RECEIVED

1,3-DIOXOLANE

CAS No. 646-06-0



Medical Research Project No. _____

The Toxicity of Dioxolane and Its Derivatives

The toxicity of dioxolane (A-162), di(beta-hydroxyethyl)formol (A-163) and polydioxolane (A-164) was tested by feeding large doses (approximately 1200 mg./Kilo for A-162 and A-163 and 600 mg./Kilo for A-164) to rats. Fifteen doses were given over a period of three weeks.

Two groups of dioxolane-treated animals and one group of di(beta-hydroxyethyl)formol animals failed to gain weight, otherwise there was no abnormality noted in the behavior of the animals, no effect on the blood picture, and no effect on the kidneys as determined by urine examinations.

No gross or micropathology was found in a representative selection of animals on which extensive pathology studies were made.

These preliminary tests indicate that the three compounds are not highly toxic since a failure to gain weight was the only demonstrable result of feeding very large doses of A-162 and A-163 to rats, while half the dosage of A-164 had no influence on the growth rate.

Medical Research Project No. _____

The Toxicity of Dioxolane and Its Derivatives

The toxicity of dioxolane (A-162), di(beta-hydroxyethyl)formol (A-163), and polydioxolane (A-164), was tested by feeding large doses of these compounds to rats and observing the animals for general signs of toxicity, weight changes, blood changes, changes in kidney function and gross and microscopic pathology.

A-162 Dioxolane A 61 ✓

Ten rats were given 0.5 cc. of a 50% aqueous solution of dioxolane for 15 doses over a period of three weeks and aside from a slight discomfort following each treatment, the animals did not exhibit any untoward signs during the three weeks, except a failure to gain in weight.

An additional five rats were given the same dosage of dioxolane for 15 treatments. This group failed to show a normal gain in weight. No anemia developed as a result of these treatments and urine examinations made frequently failed to detect any abnormality of kidney function. No significant gross or microscopic pathology was found in the lungs, stomach, liver or kidneys of these animals.

A-163 Di(Beta-Hydroxyethyl)Formol A 62 ✓

Ten rats were given 0.5 cc. of a 50% aqueous solution of dioxolane for 15 doses over a period of three weeks. These animals showed no adverse effects of the treatment except a failure to gain weight properly.

- 2 -

An additional five rats received 15 similar doses for a period of three weeks. This group gained weight satisfactorily and showed no evidence of damage to the blood or kidneys. No gross or microscopic pathology was found when the animals were sacrificed.

A-164 Polydioxolane

A 614

Ten rats were given 0.5 cc. of a 25% aqueous solution of polydioxolane for 15 treatments over a period of three weeks. These animals gained weight satisfactorily and behaved normally in other respects. No gross pathology was noted at autopsy.

An additional five rats were given the same dosage of polydioxolane for 15 doses. These gained weight satisfactorily and showed no evidence that the blood or kidney function had been affected by the polydioxolane. No gross or microscopic pathology was found when these animals were sacrificed.

AJF:as
5.23.41

OFFICE OF TOXIC SUBSTANCES
CODING FORM FOR GLOBAL INDEXING

REV. 7/27/82

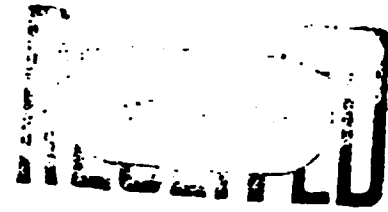
Microfiche No. (7) •	215001	1	No. of Pages	2
Doc I.D.	878 220003	3	Cld Doc I.D.	8 D S
Case No.(s)	OTS 84003A	11		
Date Produced (6)		6	Date Rec'd (6)	030483
		7	Conf. Code •	S
Check One:	<input type="checkbox"/> Publication	<input type="checkbox"/> Internally Generated	<input checked="" type="checkbox"/> Externally Generated	
Pub/Journal Name				9
				9
Author(s)				10
Organ. Name	E I DUPONT DENEMOURS & CO INC			11
Dept/Div				12
P.O. Box	13	Street No./Name	14	
City	WILMINGTON	15	State	DE
		16	Zip	19898
		17	Country	
MID No. (7)		19	D & B NO. (11)	
Contractor				21
Doc Type	• R.I. • U.P. • H.E.A.S.D 8.D. . S.U H.S F.N			22
Doc Title	TOXICITY OF 1,3-DIOXOLANE			23
Chemical Name (300 per name)	25	CAS No. (10)	24	
1,3-DIOXOLANE		646-06-0		

unc
5/24/83

1A

MEDICAL RESEARCH PROJECT NO.

TOXICITY OF 1,3-DIOXOLANE



I. INTRODUCTION

The toxicity of 1,3-dioxolane was investigated briefly under Medical Research Project MR-95 in 1941. At that time, fifteen rats were treated fifteen times over a three-week period with 0.5 ml. of a 50% aqueous solution of 1,3-dioxolane by stomach tube. The rats showed no weight loss, or gross evidence of ill effects. Red blood cell counts and urine analyses carried out on five of the rats showed no abnormal variation. The rats were sacrificed for post mortem examination, which revealed no gross or micropathology of the lungs, stomach, liver, or kidneys. Two rats were given 0.5 ml. of undiluted 1,3-dioxolane by stomach tube daily for four days. When killed six hours after the fourth treatment, they showed congestion and hemorrhage of the stomach.

1,3-dioxolane required additional toxicity information. It was, therefore, decided to supplement the above experiments with the investigations detailed in this report.

II. SCOPE OF THE EXPERIMENTS

The experiments may be divided into three categories: (1) a further investigation of the oral toxicity; (2) an investigation of the effect of liquid 1,3-dioxolane on the skin and eyes; and (3) an investigation of the effects of chronic exposure to vapor concentrations of the order of 100 p.p.m.

The sample of 1,3-dioxolane used throughout the experiments described in this report was supplied by _____ and _____ was characterized as _____

000002

III. EXPERIMENTAL

1. Oral Toxicity

a. Acute: Six rats were given single doses of 1,3 dioxolane by stomach tube. The dosage schedule was as follows:

<u>Rat No.</u>	<u>Dose</u>	<u>Result</u>
10894	8060 mg/kg	Died
10902	5380 mg/kg	Survived
10895	5580 mg/kg	Survived
10911	2390 mg/kg	Survived
10910	1590 mg/kg	Survived
10903	1060 mg/kg	Survived

Rats 10903 and 10910 showed no ill effects. Rats 10911, 10895, and 10902 showed signs of discomfort, with 10902 showing weakness in the hind legs, but all recovered within 24 hours. Rat 10894, which received 8060 mg per kg of body weight, exhibited increasing signs of weakness, lost consciousness, and died within 30 hours. Autopsy of this rat revealed slight congestion of the lungs, and congestion of the stomach. Microscopic examination showed the congestion of the stomach to be confined to the glandular portion. The surviving rats when killed also showed pale thickened mucosa and excessive mucous secretion in the stomach, which was in most cases edematous, infiltrated with lymphocytes and eosinophiles, as well as focally eroded. The approximate MFD was, therefore, found to be 8060 mg/kg.

b. Chronic: Six rats were each given 1600 mg per kg of 1,3 dioxolane daily by stomach tube, five days a week, for a total of ten treatments. Thus, each rat received

000003

a total accumulated dose of 16,000 mg/kg, or approximately twice the MFD. Two rats lost weight, but the remaining four showed a slight gain. The rats showed no ill effects and were finally killed ten days after the tenth treatment. Neither gross nor microscopic examination of the tissues revealed any pathology.

2. Skin Contact

Undiluted 1,3 dioxolane was applied three times within 20 hours to a 2 sq cm area on the upper part of the back of ten guinea pigs. No irritation occurred.

2 ml/kg (2.1 gm/kg) were rubbed into a 25 sq cm area of the shaved skin of the back of the neck and shoulders of six rabbits eight times in a period of eleven days. A total accumulated dose of 16,800 mg/kg was, therefore, applied to the skin. The results were as follows:

<u>Treat. No.</u>	<u>Result</u>
1	Skin was slightly red in 6 rabbits.
2	Skin was red in 6 rabbits.
3	Skin was thick and brown with marked erythema and inflammation (with exudate on one). One rabbit died. Cause was not clear.
4-8	Skin had scabs and was cracked and sore.

Days Recovery

12	Sores were almost healed.
16	Three rabbits showed irregular, thickened, gray area of skin - were killed.
19	Two rabbits showed thickened skin but little sign of injury - were killed.

Gross and microscopic examination of the tissues of three rabbits killed on the sixteenth day of recovery period indicated that the corium of the skin was thickened, relatively avascular, and covered by a thin layer of dried fibrin and pus. The spleen, liver, and kidney showed no pathology.

3. Effect on the Eye

One drop of undiluted 1,3 dioxolane was put in the right eye of five rabbits. One half hour later there was a slight roughening of the cornea and congestion of the conjunctival vessels in all rabbits, with edema of the lids in one. The eyes of three rabbits were normal within two days, but those of the other two continued to show signs of irritation until killed six days later.

4. Inhalation Toxicity

a. Procedure

Four dogs were observed over a period of six weeks prior to exposure to 1,3 dioxolane. Normal values for blood pressure, pulse rate, respiration rate, body temperature, hematology, and blood and urine chemistry were established for each dog during this control period. The dogs were then exposed to concentrations of 1,3 dioxolane, ranging from 62 to 156 p.p.m. and averaging 112 p.p.m. for 14 weeks. The exposure took place in a 10 cubic meter chamber for six hours a day, five days a week.

The concentration of 1,3 dioxolane in the gas chamber was measured by taking samples three times

during each exposure period and analyzing them by a method developed by and described in the appendix to this report. The average of the three analyses was considered to be the average concentration throughout the six-hour exposure.

Blood pressure, pulse rate, respiration rate, and body temperature measurements were made before and after each exposure. Blood and urine samples were taken at two-week intervals for microscopic examination and chemical analysis.

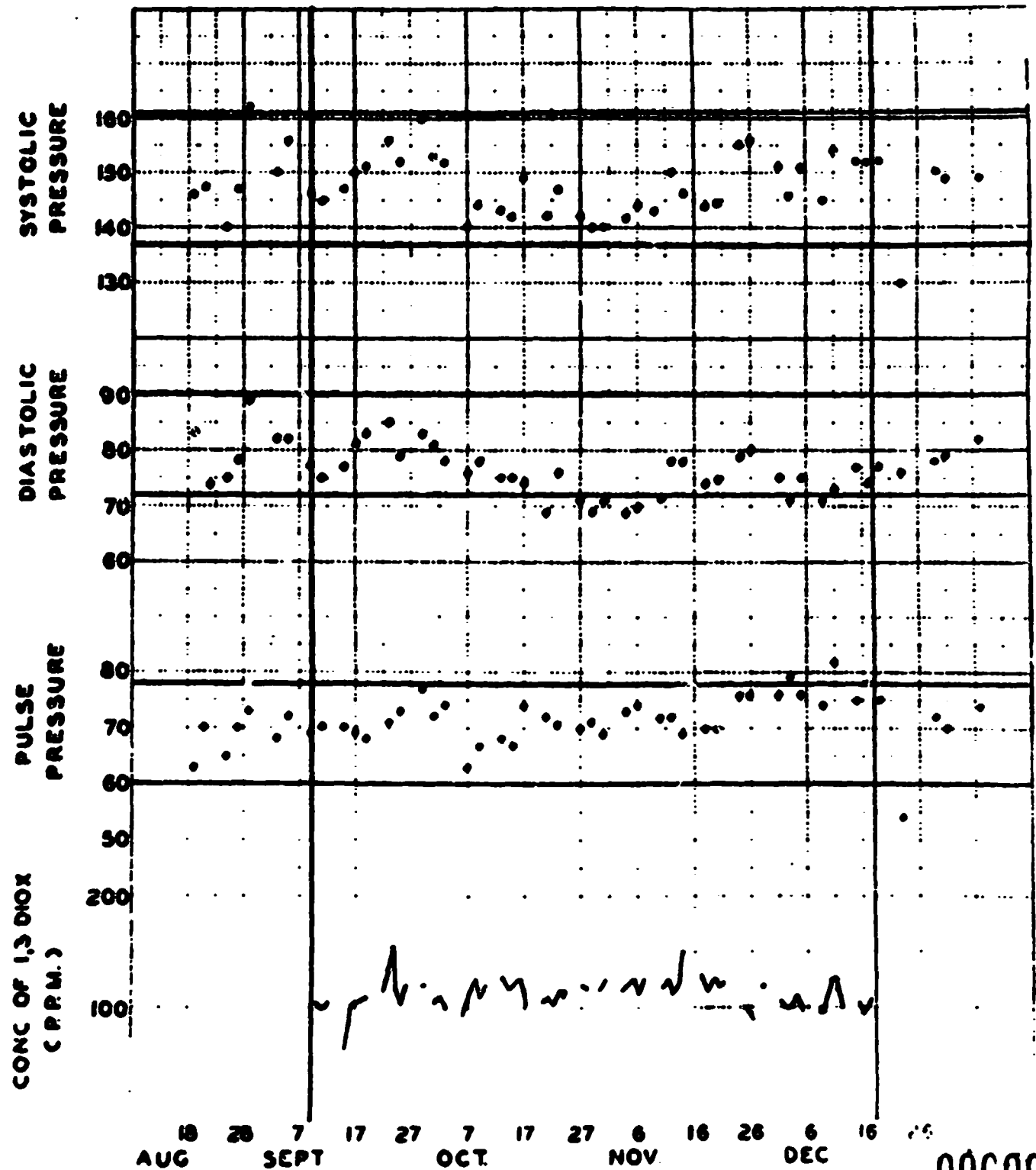
After sixty-eight exposures to 1,3 dioxolane vapor, the treatment was discontinued for three weeks before the dogs were sacrificed for pathological examination.

b. Results

(1) **Circulatory Effects:** Quality control charts were constructed for systolic pressure, diastolic pressure, and pulse pressure (Figures 1, 2, 3, and 4). Normal values for each dog were calculated from measurements made during the pre-exposure observation period. From these measurements statistical limits of normal variation in blood pressure were calculated, and lines were placed in such a position on the control charts that the probability of points falling outside the lines through chance alone would be less than 3 in 1,000.

In order to condense the data, each point 00C006

INHALATION OF 1,3 DIOXOLANE



000007

FIG. 2 DOG 174 D INHALATION OF 1,3 DIOXOLANE

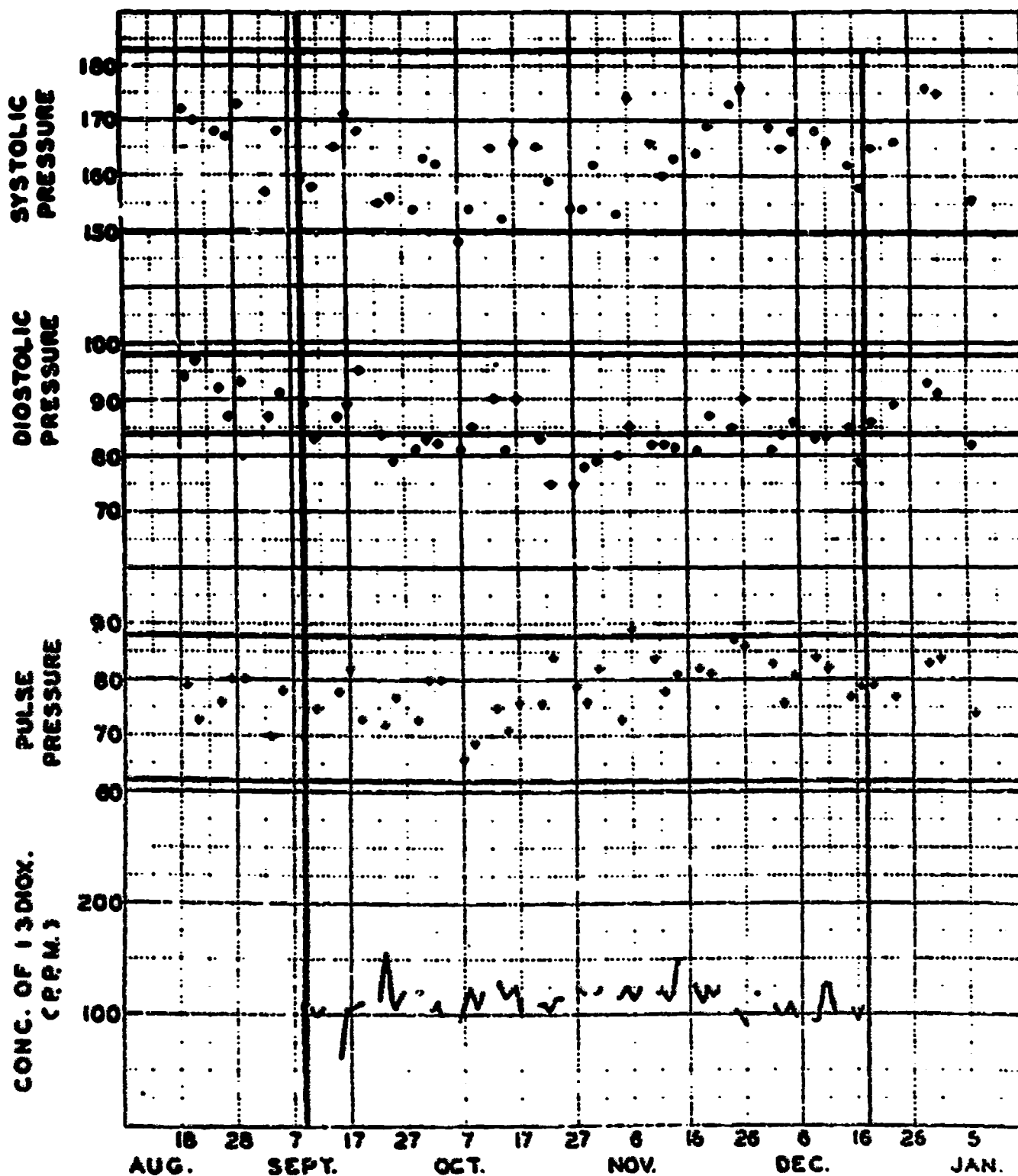
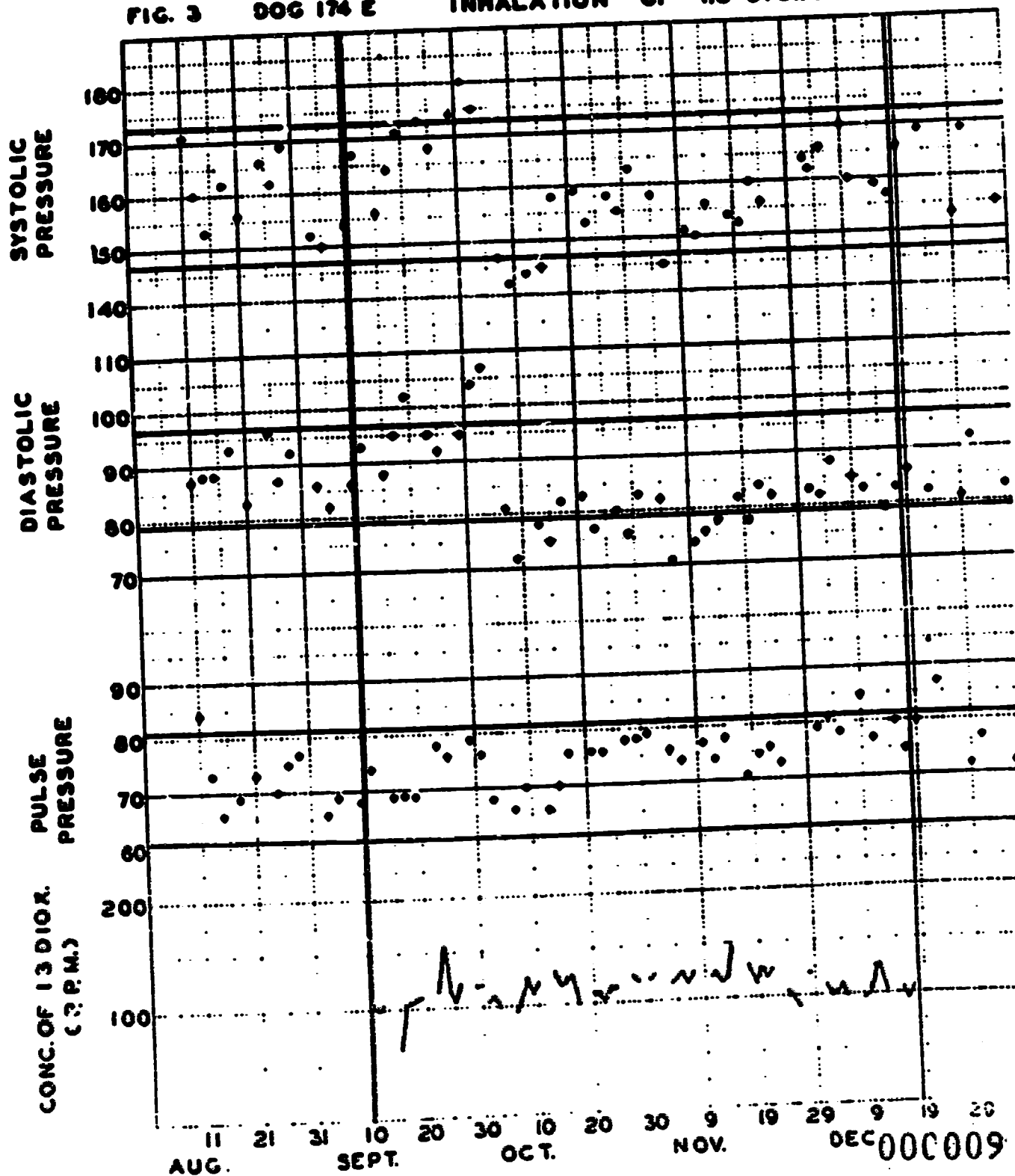
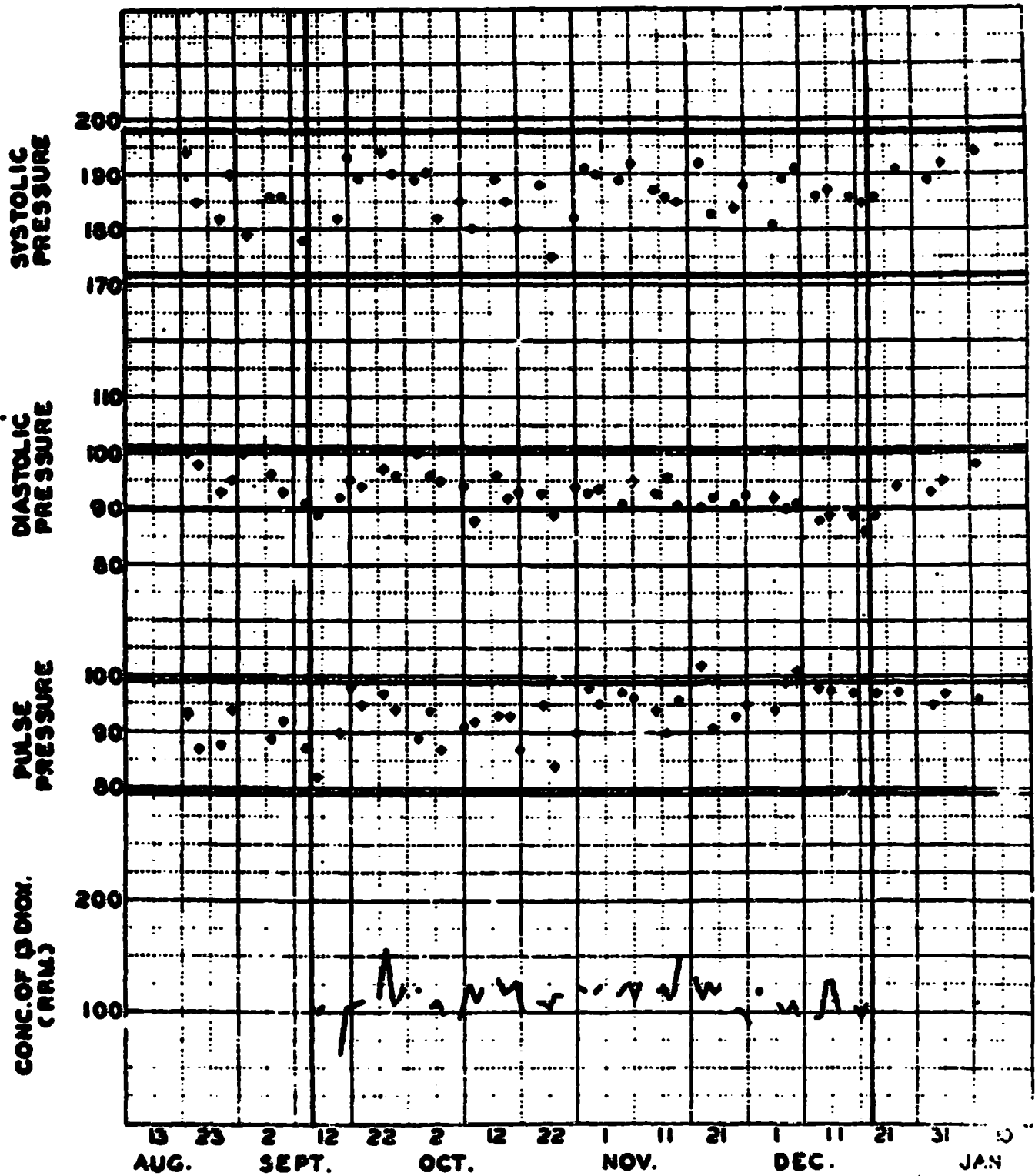


FIG. 3 DOG 174 E INHALATION OF 1,3 DIOXOLANE



000009

FIG. 4 DOG 174F INHALATION OF L3 DIOXOLANE



000010

shown in Figures 1 to 4 represents the average of four consecutive blood pressure measurements. This fact was taken into account in calculating the values of the limit lines on the control charts.

... The systolic pressure remained fairly steady throughout exposure for three of the four dogs. Dog E showed a rise in the second week and a subsequent drop in the fifth week. The diastolic pressures of all the dogs showed a tendency to fall. This drop became statistically significant for Dog A in the sixth week of exposure, for Dog D in the second week, for Dog E in the fifth week, and for Dog F in the thirteenth week. The sharp drop in systolic and diastolic pressures of Dog E occurred during a period when the dog showed a rise in body temperature. It is, therefore, probable that Dog E was also suffering from the results of an infection. The pulse pressures of all dogs showed a steady trend upward, becoming statistically significant only in the last two weeks of exposure.

After the dogs were removed from exposure, the systolic pressure remained normal, and the diastolic and pulse pressures of all the dogs returned to within normal limits within two weeks.

000011

respiration rate were not observed throughout exposure.

(2) Effect on Body Temperature: There were no significant changes in the body temperature of Dogs A, D, and F. The temperature of Dog E was 1 to 2 degrees above normal between the second and the fifth weeks of exposure. This rise was believed to be caused by an infection.

(3) Metabolic Effects:

(a) Weight: Two of the dogs (D and F) retained essentially the same weight throughout exposure. The other dogs (A and E) gained 2 and 3 lbs. respectively.

(b) Blood Sugar: Blood sugar values were determined on fasting dogs and normal values were obtained throughout the exposure and recovery periods. No sugar was found in the urine.

(4) Hematological Effects: There was no significant variation in the number or morphology of the erythrocytes or leukocytes.

(5) Pathology: The dogs were electrocuted and autopsies performed. Microscopic examinations were made of the heart, lungs, spleen, pancreas, liver, kidney, and adrenal. No pathology was found which could be attributed to 1,3 dioxolane.

IV. DISCUSSION

When given by mouth, 1,3 dioxolane was relatively non-toxic for rats, nor was it possible to demonstrate systemic toxic effects by the daily application of 2 ml/kg of 1,3 dioxolane to the skin of rabbits, five days a week, for a total of ten applications.

Severe local irritation of the skin resulted from the repeated application of 1,3 dioxolane to rabbits. This was followed by marked thickening and hardening of the skin at the site of application. A similar reaction occurs after the repeated application of gasoline to rabbit skin, and is, therefore, probably due to defatting and drying of the skin, rather than to a specific chemical effect.

It is apparent, therefore, that the local effect of 1,3 dioxolane on the skin is not unique. But since 1,3 dioxolane is capable of liberating formaldehyde on hydrolysis and some individuals are sensitive to formaldehyde in extremely low concentration (1:8,000,000), occasional sensitization dermatitis may be encountered. In view of the fact that 1,3 dioxolane is a local skin irritant, it is not surprising that it also produces irritation of the eye.

The chronic inhalation experiments on dogs revealed that exposure to a concentration of approximately 100 p.p.m., six hours a day, five days a week for three and a half months, produced a characteristic set of circulatory changes which were consistent in all four dogs. These were a relatively prompt lowering of the diastolic pressure in three of the

to six weeks of exposure, and after thirteen weeks of exposure for the fourth dog, and a slow rise of pulse pressure which became statistically significant after thirteen to fourteen weeks of exposure.

These circulatory changes were not associated with any demonstrable pathology at autopsy. On the other hand, similar circulatory changes did not occur in other dogs not exposed to 1,3 dioxolane, which were under observation at the same time. We therefore associate the observed circulatory effects with the inhalation of 1,3 dioxolane. Such effects, while non-specific, have in other instances preceded the occurrence of organ pathology and are, therefore, taken as an indication of beginning toxic action. The ultimate effects of continued exposure cannot, of course, be predicted on the basis of the earliest effects.

Some guidance in interpreting the possible toxicity of 1,3 dioxolane by inhalation may be obtained from a consideration of trichlorethylene. Exposure of dogs in the

to concentrations of trichlorethylene averaging approximately 200 p.p.m. caused a prompt rise in pulse pressure and a slow fall in diastolic pressure (MR-54 report). On the basis of human experience, the generally accepted maximum allowable concentration for trichlorethylene is usually set at 200 p.p.m. There is no implication that 1,3 dioxolane and trichlorethylene produce the same or similar physiological effects, but there is a suggestion by

000014

as low as or lower than 100 p.p.m.

To be on the safe side, it is suggested that 1,3 dioxolane should not be used or recommended for use at the present time in applications where good ventilation cannot be obtained. It is also suggested that company employees working with 1,3 dioxolane should be subjected to periodic medical examination, including standard blood pressure measurement, so that accurate information on the effect of 1,3 dioxolane on human beings can be accumulated. If any physiological abnormalities attributed to exposure to 1,3 dioxolane are uncovered, an attempt should be made to correlate them with the type of exposure as well as its severity and duration.

V. MEDICAL SUPERVISION OF WORKERS

Because of its potential ability to affect the circulatory system, certain precautions should be taken in areas where workers may be exposed to 1,3 dioxolane. It is recommended that workers who show any signs of pre-existent circulatory abnormality should not be assigned to an area involving exposure. It would be advisable to have a medical examination, including standard blood pressure measurements, on all exposed workers at monthly intervals. The blood pressure values should be recorded on control chart

in order that abnormalities can be readily detected. Any person showing an abnormal diastolic pressure, pulse pressure, or diastolic pressure:pulse pressure score should be re-examined within one week, and if the abnormality has persisted, an investigation should be made into its

cause. If it appears likely that the abnormality has resulted from exposure to 1,3 dioxolane, the worker should be temporarily removed from exposure until he has completely recovered, and at the same time an effort should be made to reduce his future occupational exposure.

Dermatitis from skin contact with 1,3 dioxolane should be avoidable by recommending scrupulous washing of the skin with soap and water as soon as possible after contact. Contaminated clothing and shoes should not be worn again until thoroughly decontaminated. The possibility that some workers will show a sensitization dermatitis to the small amounts of formaldehyde liberated by hydrolysis of 1,3 dioxolane must be born in mind. Such individuals would probably have to be completely removed from exposure.

We believe it is worth emphasizing that good medical records on workers exposed to 1,3 dioxolane will provide an invaluable extension to the toxicity data which we have obtained by animal experimentation.

SUMMARY

The minimum fatal dose of 1,3 dioxolane for rats was found to be 8060 mg/kg of body weight when the compound was given orally. The principal effect of large single oral doses of 1,3 dioxolane appears to be a congested and thickened mucosa of the stomach. Chronic treatment consisting of ten doses of 1600 mg/kg each did not produce any detectable pathology.

Inhalation of air containing an average of 112 p.p.m.

and ranging from 62 to 156 p.p.m. for six hours a day, five days a week, over a period of three and one-half months, caused in four dogs a statistically significant fall in diastolic pressure and a more delayed rise in pulse pressure. Significant changes in pulse rate, respiration rate, and body temperature, as well as metabolic, hematologic, and pathologic changes, could not be detected.

Rubbing 2.1 gm/kg of 1,3 dioxolane into the skin of rabbits over a 25 sq cm area eight times over a period of eleven days caused acute erythema, inflammation, cracking, and thickening of the skin, but no injury to the organs through absorption of the compound. Instillation of one drop of 1,3 dioxolane in the rabbit eye caused marked irritation and conjunctivitis which persisted from two to six days.

APPENDIX

Determination of the Concentration of 1,3 Dioxolane in Air

Collection of Sample: A 10 to 15 liter sample of air containing 1,3 Dioxolane is drawn from the chamber at a rate of approximately 0.5 liters per minute through three bubblers connected in series and each containing 25 ml of ice cold distilled water. The bubblers are kept cool by immersion in an ice bath.

Method: 1.0 ml of the sample containing 1,3 dioxolane is added to 10 ml of H_2SO_4 reagent (4 parts H_2SO_4 to 1 part H_2O) and mixed well. 0.4 ml of 4% alcoholic 4-Naphthol is then

added with further mixing. The mixture is heated in a boiling water bath for 10 minutes and cooled. A yellow color with greenish fluorescence develops in the presence of 1,3 dioxolane. The test solution is read in the Coleman Spectrophotometer at 420 m μ ¹ against a blank containing 10 ml sulfuric acid reagent, 1 ml water, and 0.4 ml β -naphthol reagent. The concentration in the sample is calculated by comparison with a standard curve made from the analysis of known amounts of 1,3 dioxolane.

- 1 Spectrographic analysis shows an absorption maximum at about 480 m μ , but because of practical considerations, 420 m μ was found to be more satisfactory for routine determinations.

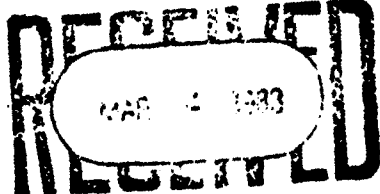
OFFICE OF TOXIC SUBSTANCES
CODING FORM FOR GLOBAL INDEXING

REV. 7/27/82

Microfiche No. (7) •	215001	1	No. of Pages	2
Doc I.D.	878220004	3	Old Doc I.D.	8DS
Case No.(s)	OTS 84003A	4		5
Date Produced (6)	6	Date Rec'd (6)	7	Conf. Code •
		030483		S
Check One:	<input type="checkbox"/> Publication	<input type="checkbox"/> Internally Generated	<input checked="" type="checkbox"/> Externally Generated	
Pub/Journal Name				9
				9
Author(s)				10
Organ. Name	E I DUPONT DENEMOURS & CO INC			11
Dept/Div				12
P.O. Box	13	Street No./Name	14	
City	WILMINGTON	15	State	DE
		16	Zip	19898
		17	Country	18
MID No. (7)	19	D & B NO. (11)	20	
Contractor				21
Doc Type	•R.I. • U.P. • H.E.A.S.D. 8.D. . S.U H.S F.N			22
Doc Title	IN VITRO MICROBIAL			23
MUTAGENICITY STUDIES OF				
1, 3-DIOXOLANE				
Chemical Name (300 per name)	25	CAS No. (10)	24	
1, 3-DIOXOLANE		646-06-0		

check
5/13/83

1A



E. I. du Pont de Nemours and Company
Haskell Laboratory for Toxicology and Industrial Medicine
HASKELL LABORATORY REPORT NO. _____

MR NO. _____

Material Tested: 1,3-Dioxolane (64.5% A.I.)

Material Submitted By: _____

Sample Ready for Testing: 4-22-76

IN VITRO MICROBIAL MUTAGENICITY STUDIES OF 1,3-DIOXOLANE

Materials and Methods: Five histidine-requiring strains of Salmonella typhimurium were used in the mutagen assays. Strains TA 1535 and TA 100 are used to detect base-pair substitution mutations, whereas strains TA 1537, TA 1538 and TA 98 are used to detect frame-shift mutations.

The tests were performed in the presence and absence of a rat-liver homogenate activation system (S-9). In the absence of metabolic activation, 0.1 ml of a solution of the test compound and approximately 10⁸ bacteria were added to 2 ml of top agar (0.6% agar, 0.6% NaCl, 0.05 mM L-histidine, 0.05 mM biotin). The solution was mixed and poured on the surface of a Davis minimal agar plate. The metabolic activation system involved the addition of 0.5 ml of S-9 mixture to the chemical-top agar solution. The S-9 mix contains per ml: 0.3 ml of the 9,000 X g supernatant of homogenized rat liver, 8 mM MgCl₂, 33 mM KCl, 5 mM glucose-6-phosphate, 4 mM NADP and 100 mM sodium phosphate (pH 7.4). This mixture was added directly to the top agar immediately before it was poured over the minimal agar plate.

Prior to testing for mutagenicity, the compound was tested for toxicity to the tester strains.

Appropriate controls were included for each strain. In the nonactivated system these controls consisted of a negative, or solvent control, and positive controls. A second negative control (-S-9 control) is included in the activated system to measure any activity of the compound in the absence of the S-9 activator mixture.

All plates were incubated at 37°C for 48 hours.

Results: Tables I and II.

Summary: 1,3-Dioxolane was tested in Salmonella typhimurium strains TA 1535, TA 1537, TA 1538, TA 98 and TA 100 in concentrations up to 10,000 µg per petri plate. The compound was not mutagenic in the microbial assays either in the presence or absence of a liver microsomal system i.e., it did not significantly increase the spontaneous mutation frequency.

FCB:EEB:ljm

Date: May 4, 1976

200000

MUTAGENIC ACTIVITY OF 1,3-DIOXOLANE IN *SALMONELLA* TYPHIMURIUM STRAINS
TA 1535, TA 1537, TA 1538, TA 98 AND TA 100 WITH METABOLIC ACTIVATION

Compound Added	Histidine + Revertants Per Plate**				
	TA 1535	TA 1537	TA 1538	TA 98	TA 100
Distilled H ₂ O	14	12	20	39	115
-S.9*	6	7	11	23	114
1,3-Dioxolane µg/Plate					
2000 "	9	9	21	47	117
4000 "	14	16	19	33	112
6000 "	16	11	17	35	117
8000 "	7	9	17	35	109
10,000 "	13	8	14	35	117
2AA µg/Plate					
5 "					768
10 "	309		1636	1706	
100 "		846			

2AA = 2-Aminoanthracene, positive control.

* = Test plate without S.9 activators.

** = Average of two plates.

TABLE II

MUTAGENIC ACTIVITY OF 1,3-DIOXOLANE IN SALMONELLA TYPHIMURIUM STRAINS
TA 1535, TA 1537, TA 1538, TA 98 AND TA 100 WITHOUT METABOLIC ACTIVATION

<u>Compound Added</u>	<u>Histidine + Revertants Per Plate*</u>				
	<u>TA 1535</u>	<u>TA 1537</u>	<u>TA 1538</u>	<u>TA 98</u>	<u>TA 100</u>
Distilled H ₂ O	5	9	12	17	120
1,3-Dioxolane μg/Plate					
2000 "	6	7	9	16	125
4000 "	11	8	7	22	100
6000 "	12	12	7	29	108
8000 "	14	8	8	23	113
10,000 "	6	5	8	19	112
MNNG 2 μg/Plate	1827				2149
9AAc 50 "		1123			
2NF 25 "			1047	1418	

MNNG = N-Methyl-N'-Nitro-N-Nitrosoguanidine, positive control.

9AAc = 9-Aminoacridine, positive control.

2NF = 2-Nitrofluorene, positive control.

* = Average of two plates.

000000

60000000-18

CERTIFICATE OF AUTHENTICITY

THIS IS TO CERTIFY that the microimages appearing on this microfiche are accurate and complete reproductions of the records of U.S. Environmental Protection Agency documents as delivered in the regular course of business for microfilming.

Date produced 6-1-85
(Month) (Day) (Year)

Carol M. Johnson
Camera Operator

Place Rockville Maryland
(City) (State)

 **informatics**
general corporation